

CLAIMS

We claim:

1. A method of processing a client packet from a client in a NAT system including a NAT machine and a plurality of servers, the method comprising the steps

5 of:

preparing a response packet responsive to the client packet;

performing, by one of the servers, a translation operation on the response packet to produce a translated response packet; and

transmitting the translated response packet directly to the client, thereby bypassing the NAT machine.

2. The method of claim 1, further comprising:

determining whether translation instructions are stored in said one of the servers;

executing the performing step if the determining step indicates that the translation instructions are stored in said one of the servers.

3. The method of claim 2, further comprising:

sending the response packet from said one of the servers to the NAT machine if the determining step indicates that the translation instructions are not stored in said one of the servers.

4. The method of claim 2, further comprising:

5 performing a translation operation on all subsequent response packets prepared by said one of the servers based on the translation instructions; and transmitting the translated subsequent response packets directly to the client.

5. The method of claim 2, further comprising:

determining, by the NAT machine, if predetermined criteria have been satisfied for sending the translation instructions to said one of the servers; and sending the translation instructions to said one of the servers if the predetermined criteria have been satisfied.

6. The method of claim 2, wherein the translation instructions identify information to be modified in a header of the response packet.

15 7. The method of claim 2, wherein the performing step includes:

evaluating a header of the response packet to identify a current IP destination address and a current destination port indicated in the header,

determining, using the translation instructions, a client IP address and a client port associated with the current IP destination address and the current destination port, and

modifying the header of the response packet to designate the client IP address and client port as the current IP destination address and the current destination port, respectively.

8. The method of claim 1, further comprising:

transmitting, by the NAT machine, instructions to stop the translation operation; and

transmitting, by said one of the servers, the response packet to the NAT machine according to said instructions.

9. A NAT (Network Address Translation and Port Mapping) system comprising:

a NAT machine for receiving a client packet from a client and performing an inbound translation on the client packet to produce a translated client packet; and

a plurality of servers coupled to the NAT machine, one of the servers receiving the translated client packet and preparing a response packet responsive

to the translated client packet, said one of the servers including an outbound translation module for performing a translation operation on the response packet to produce a translated response packet and for transmitting the translated response packet directly to the client, thereby bypassing the NAT machine.

5 10. The system of claim 9, wherein said one of the servers determines whether translation instructions are stored in said one of the servers, performs the translation operation on the response packet if the translation instructions are stored in said one of the servers, and sends the response packet to the NAT machine if the translation instructions are not stored in said one of the servers.

10 11. The system of claim 10, wherein said one of the servers performs translation operations on all subsequent response packets prepared by said one of the servers based on the translation instructions, and transmits the translated subsequent response packets directly to the client.

15 12. The system of claim 10, wherein the translation instructions identify information to be modified in a header of the response packet.

13. The system of claim 10, wherein said one of the servers evaluates a header of the response packet to identify a current IP (Internet Protocol) destination address and a current destination port indicated in the header, determines, using the translation instructions, a client IP address and a client port associated with the current IP destination address and the current destination port, and modifies the header of the response packet to designate the client IP address and client port as the current IP destination address and the current destination port, respectively.

14. The system of claim 9, wherein the NAT machine transmits to said one of the servers instructions not to perform the translation operation on the response packet, and said one of the servers transmits the response packet to the NAT machine according to the instructions.

15. A computer program product embodied on computer readable media readable by a computing device, for processing a client packet from a client in a NAT (Network Address Translation & Port Mapping) system including a NAT machine and a plurality of servers, the product comprising computer executable instructions for:

preparing a response packet responsive to the client packet;

performing, by one of the servers, a translation operation on the response packet to produce a translated response packet; and

transmitting the translated response packet directly to the client, thereby bypassing the NAT machine.

5 16. The computer program product of claim 15, further comprising computer executable instructions for:

determining whether translation instructions are stored in said one of the servers;

executing the translation operation if the translation instructions are stored in said one of the servers; and

sending the response packet to the NAT machine if the translation instructions are not stored in said one of the servers.

17. The computer program product of claim 16, further comprising computer executable instructions for:

15 performing translation operations on all subsequent response packets prepared by said one of the servers based on the translation instructions; and
transmitting the translated subsequent response packets directly to the client.

18. The computer program product of claim 16, further comprising computer executable instructions for:

determining if predetermined criteria have been satisfied for sending the translation instructions to said one of the servers; and

5 sending the translation instructions to said one of the servers if the predetermined criteria have been satisfied.

19. The computer program product of claim 16, wherein the translation instructions identify information to be modified in a header of the response packet.

20. The computer program product of claim 16, wherein the computer executable instructions for performing the translation operation include computer executable instructions for:

evaluating a header of the response packet to identify a current IP (Internet Protocol) destination address and a current destination port indicated in the header,

determining, using the translation instructions, a client IP address and a client port associated with the current IP destination address and the current destination port, and

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modifying the header of the response packet to designate the client IP address and client port as the current IP destination address and the current destination port, respectively.

21. The computer product of claim 15, further comprising computer executable instructions for:

transmitting, by the NAT machine, instructions to stop the translation operation; and

transmitting, by said one of the servers, the response packet to the NAT machine according to said instructions.